BACKGROUND NOISE LEVEL ALONG JALAN KUCAI LAMA, KUALA LUMPUR: A PRELIMINARY OBSERVATION

SHAM SANI

SINOPSIS

Kertas ini melaporkan satu siri pemerhatian mengenai paras bunyi bising yang direkodkan selama enam hari berterusan di sebuah bengkel membaiki kereta di Jalan Kucai Lama, Kuala Lumpur. Kajian ini adalah sebahagian daripada satu projek yang lebih besar untuk menentukan paras latar bunyi bising beberapa kegiatan (seperti perniagaan, perindustrian dan kediaman) di kawasan Bandar Kuala Lumpur-Petaling Jaya. Hasil kajian menunjukkan bahawa dalam satu-satu hari, paras bunyi bising kedapatan lebih tinggi pada waktu siang daripada waktu malam dan paras minimumnya berlaku di antara jam 0300 – 0400. Hampir 88% daripada masa, penduduk berhampiran terdedah kepada paras bunyi bising melebihi 70 dBA, sementara kira-kira 75% daripada masa, mereka terdedah kepada paras bunyi bising melebihi 75 dBA, iaitu had tertinggi paras min bunyi bising bagi kawasan Kuala Lumpur. Hari-hari bekerja amnya adalah lebih bising daripada hari-hari kelepasan am.

SYNOPSIS

The present paper reports a series of observations of noise levels recorded during six days of a week at a motor workshop along Jalan Kucai Lama, Kuala Lumpur. The study forms part of a larger project to determine the background noise level for different types of activities (e.g. commercial, manufacturing and residential) within the Kuala Lumpur-Petaling Jaya urban area. The results indicate that in any one day, the noise levels tend to be relatively higher during the day with minimum values occurring sometime during 0300 – 0400 hours. Almost 88% of the time, the residents within the vicinity are exposed to noise levels in excess of 70 dBA. About 75% of the time, the noise levels exceed 75 dBA which is the upper limit of mean noise level estimated for Kuala Lumpur. Weekdays are generally more noisy than weekends.

INTRODUCTION

Generally surveys and research on noise levels and noise problems in Malaysia are few and sporadic. Most available surveys to date have have been carried out by universities, environmental interest groups (e.g. Tajuddin Hj. Kechik & Mansor Ibrahim, 1979; Gurdashan Kaur, 1983), and the Factory and Machinery Department which conducted studies within the premises of factories. In more recent years, however, with equipments donated by the Japanese Government, the Division of Environment has begun a more intensive effort to measure noise levels particularly in large urban centres such as Kuala Lumpur. From noise measurements conducted

by the Division of Environment in central areas of Kuala Lumpur, it was found that L_{eq} reading (equivalent continuous sound pressure level) for the day time ranges between 74 – 80 dBA. Tajuddin Hj. Keching & Mansor Ibrahim (1979) estimated that the mean noise level averaged for the whole of Kuala Lumpur was in the region of 70 – 75 dBA. Much of the problem came primarily from motor vehicles. Motorcycles, for example, emitted noise levels up to 86 dBA (Goh, 1982).

The present exercise reports a series of observations of noise levels recorded during six days of a week covering a good part of Monday (21.11.83) through to part of Sunday (27.11.83) at a motor car workshop along Jalan Kucai Lama, Kuala Lumpur. The latter is a major thoroughfare linking Kuala Lumpur and Petaling Jaya to the main south highway. It also provides a bypass for vehicles coming from west of Kuala Lumpur (Shah Alam, Kelang and Port Kelang) to Seremban and south. In the present study, both indoor dan outdoor readings were recorded in order to appreciate not only the pattern of noise levels at the vicinity of the workshop but also those emitted by the activities within the workshop itself. The study forms part of a larger project to determine the background noise level for different types of activities (e.g. manufacturing, commercial, business and residential) within the Kuala Lumpur-Petaling Jaya urban area. It is hoped that such studies will help establish baseline data which are useful to urban noise abatement programmes.

METHODOLOGY

Noise levels were measured using a sound level meter ANSI Type 2 Model 452 manufactured by the Scott Instrument Laboratories, USA. It is portable, battery operated and is specifically designed so that noise level may be read directly from a readbout meter. In the present study, each measurement was repeated twice and an average reading was taken. Battery condition was checked before the beginning of each measurement to ensure that the batteries have not dropped below the end point during measurement.

The Model 452 has been carefully calibrated at the Manufacturer's laboratory by free-field comparison against a precision microphone. The components and circuits used in the 452 Model are extremely stable and no shift in calibration should be expected in normal use.

In the present investigation, measurements of noise levels were taken every hour both inside and outside the workshop premises during the period between 21.11.83 through to 27.11.83

RESULTS AND DISCUSSION

Figure 1 shows the mean indoor and outdoor noise levels averaged over six days at the observation site. It will be observed that in any one day, the noise levels tend to be relatively higher during the day between 0700 – 2400 hours local time (L.T.). Minimum noise levels were recorded

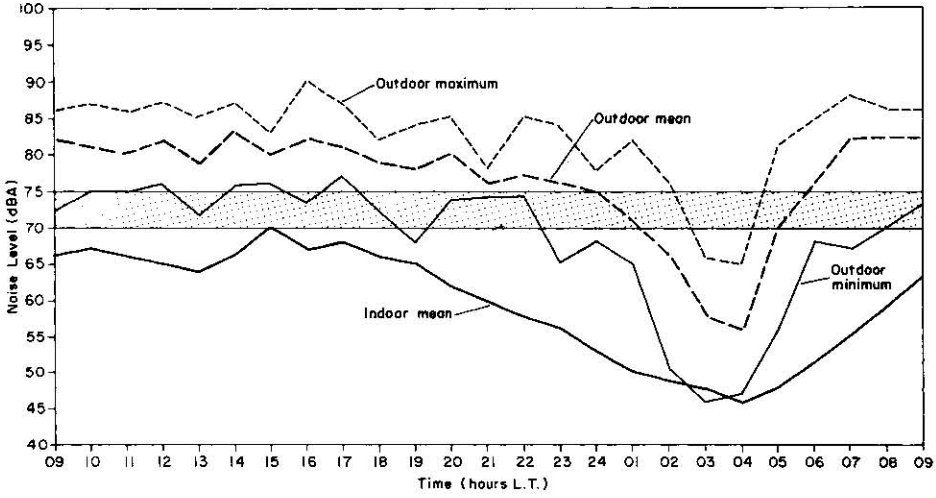

FIGURE 1. Mean Noise Level (dBA) at a Motor Car Workshop in Jalan Kucai Lama, Kuala Lumpur, Averaged Over Six Days (Monday, 21-11-83 — Sunday, 27-11-83), the 70 – 75 dBA Band is the Mean Noise Level Averaged for the Whole of Kuala Lumpur Estimated by Tajuddin Hj. Kecik & Mansor Ibrahim (1979)

in the early morning between 0300 – 0400 hours (L.T.). The effects of heavy traffic volume during rush hours were not all that clear from the graph shown in Figure 1. Instead, the ourdoor noise levels remain generally high with a L_{50} reading ranging from 75 – 83 dBA throughout the day up to midnight.

The range of background noise levels in the vicinity of the study site is shown by the stippled portion in Figure 1. This indicates that in the course of a day, the noise level ranges from 46 – 90 dBA and, with the exception of the minimum noise level for 1900 hours (L.T.), all others between 0800 – 2200 hours (L.T.) had a minimum reading in excess of 70 dBA. In other words, almost 88% of the time the residents within the vicinity are exposed to noise level in excess of 70 dBA. Compared with the mean noise level averaged for the whole of Kuala Lumpur as estimated by Tajuddin Hj. Kechik & Mansor Ibrahim (1979), the outdoor noise level at the investigation site in the present study is generally much higher. It is observed that 75% of the time, the noise level is in excees of 75 dBA which is the upper limit of mean noise level for Kuala Lumpur.

Noise levels inside the workshop shows a similar pattern but much lower in magnitude to those outside especially between about 0900 – 1700 hours (L.T.) (Figure 1). Thereafter, the level decreased from 65 dBA to 46 dBA round about 0400 hours (L.T.). This is expected as much of the noise contributed by the workshop activities ceases when the workshop closes in the

evening. It is difficult, on the basis of the present observation, to decide on the quantum of noise levels contributed by the workshop activities towards those of the outdoor. What is certain at this stage is that once the workshop is closed for the day (about 1700 – 1800 hours L.T.), any possible noise from this source will be minimal and falls within the normal expected range of a similar residential home.

Readings for L_{90}, L_{50} and L_{10} (dBA) of the outdoor noise levels recorded at the investigation site along Jalan Kucai Lama, Kuala Lumpur during the study period are shown in Figure 2. Although due to the shortness of the study period, the pattern may not be all that accurate, the general trend is probably indicative of the noise regime for the area. A longer observation period with shorter measurement intervals will be needed before a more accurate pattern can be established.

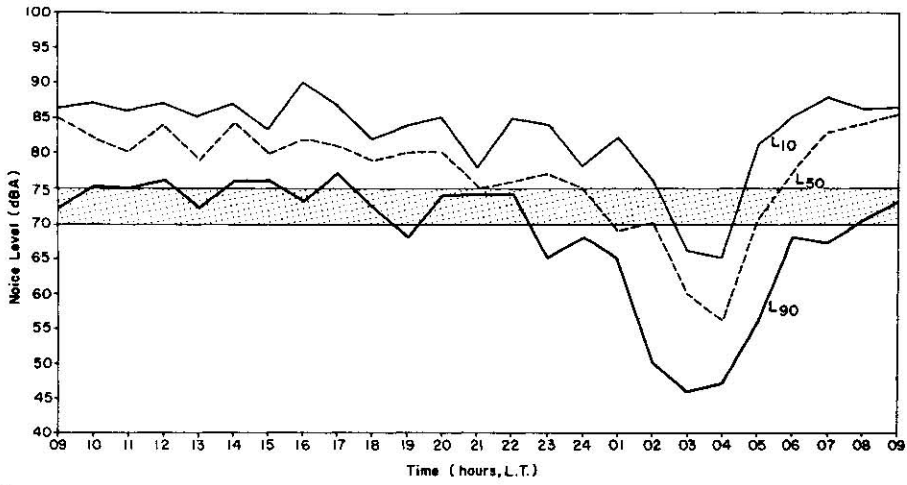

FIGURE 2. L_{90}, L_{50} and L_{10} Readings (dBA) of the Outdoor Noise Levels Recorded Along Jalan Kucai Lama, Kuala Lumpur Between Monday (21-11-83) — Sunday (27-11-83). The 70 – 75 dBA Band Being the Mean Noise Level Averaged for the Whole of Kuala Lumpur is Also Included for Comparison

Figure 3 – 5 show indiviually, the patterns of noise levels both indoor and outdoor) at the investigation site for Monday (21.11.83) through to Sunday (27.11.83). As expected, the outdoor noise levels for the average working days are slightly higher than those of the weekends. The average noise level for Monday — Friday ranges from 76 – 79 dBA while that of Saturday — Sunday is 74 dBA. It is also noted that over the weekends, the duration for which the outdoor noise level was below 75 dBA (the average for the whole of Kuala Lumpur) was longer (almost 40% of the time) compared to that of weekdays, (on average about 20% of the time).

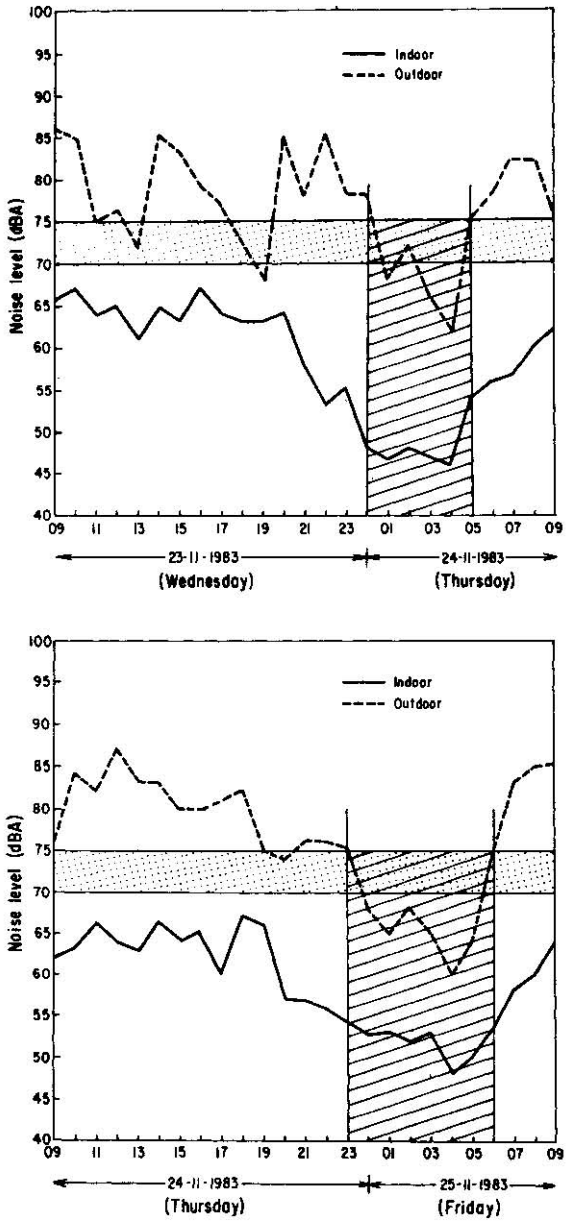

FIGURE 4. Mean Noise Levels (dBA) at a Motor Car Workshop in Jalan Kucai Lama, Kuala Lumpur, for Wednesday (23-11-83) Through to Friday (25-11-83). The 70 – 75 dBA Band Being the Mean Noise Level Averaged for the Whole of Kuala Lumpur is Also Included. The Period for Which the Outdoor Noise Level 75 dBA is Shown by Strip

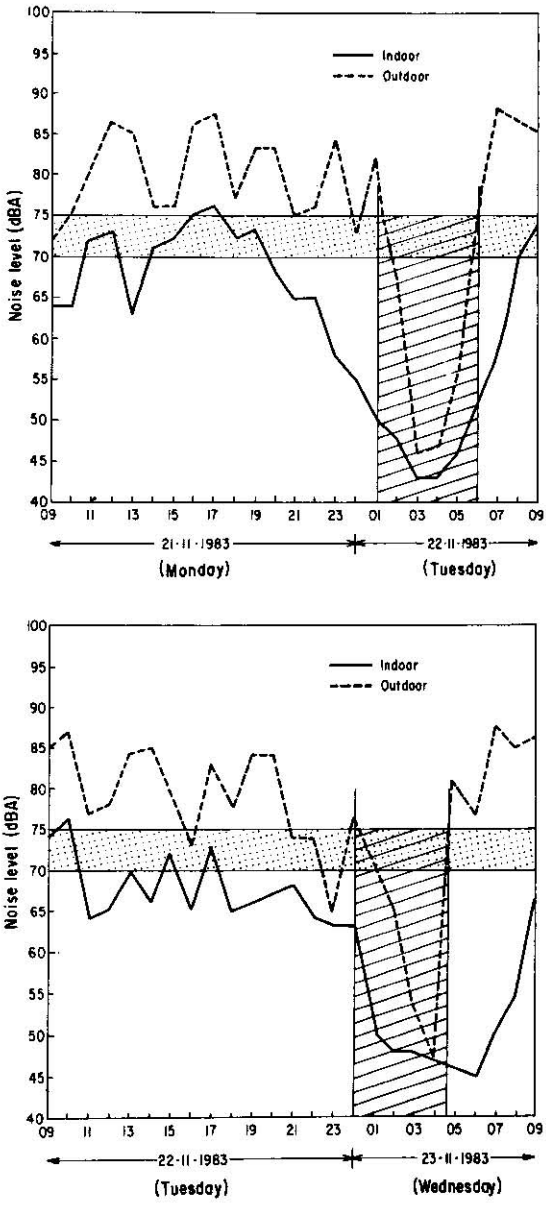

FIGURE 3. Mean Noise Levels (dBA) at a Motor Car Workshop in Jalan Kucai Lama, Kuala Lumpur, for Monday (21-11-83) Through to Wednesday (23-11-83). The 70 – 75 dBA Band Being the Mean Noise Level Averaged for the Whole of Kuala Lumpur is Also Included. The Period for Which the Outdoor Noise Level 75 dBA is Shown by Strips

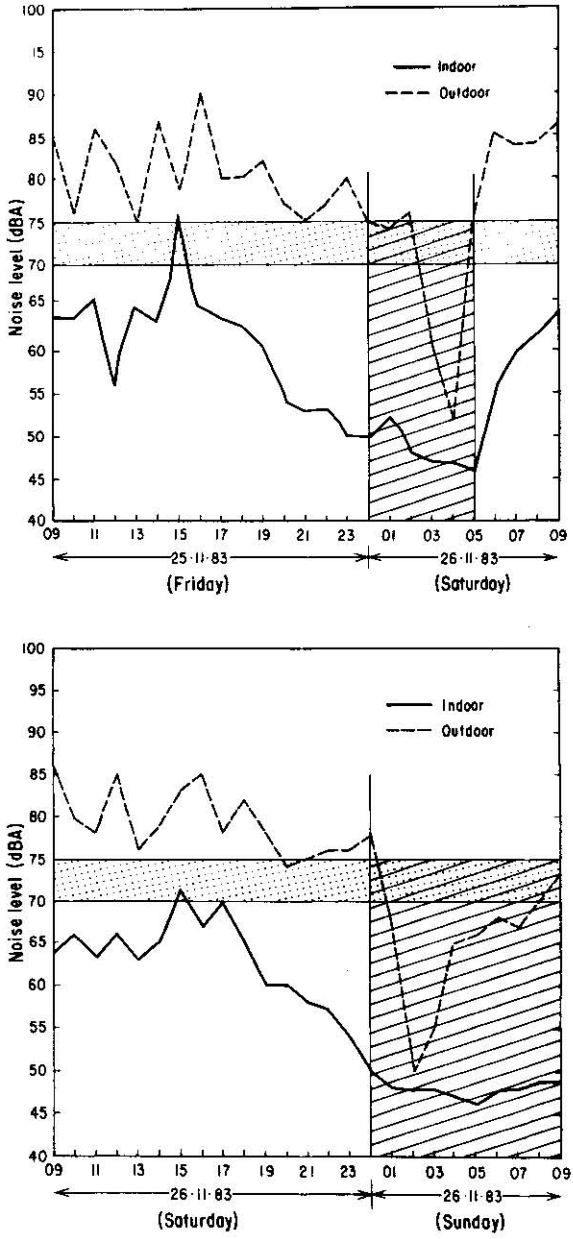

FIGURE 5. Mean Noise Levels (dBA) at a Motor Car Workshop in Jalan Kucai Lama, Kuala Lumpur, for Friday (25-11-83) Through to Sunday (27-11-83). The 70 – 75 dBA Band Being the Mean Noise Level Averaged for the Whole of Kuala Lumpur is Also Included. The Period for Which the Outdoor Noise Level 75 dBA is Shown by Strip

For the indoor noise level, it was noted that for Wednesday — Sunday, this was generally well below 70 dBA. For the rest of the days, the noise level particularly during the day reached well in excess of 70 dBA. Such variations could partly be due to the volume of repair works being handled at the time and also the detailed nature of activities within the workshop itself.

Table 1 shows the frequency of occurrence of outdoor noise levels at the investigation site calculated over the six-day period. In many ways, this confirms an earlier observation that weekdays are generally more noisy than weekends. It is observed that in all cases, the percentage frequency of noise level in excess of 70, 75 and 80 dBA was lower during Saturday – Sunday than the rest of the weekdays. On the average, however, between 54% – 71% of the time, the outdoor noise level at the investigation site was well above 75 dBA including weekends.

The situation for indoor noise level is shown in Table 2. It it noted that the percentage frequency of indoor noise level exceeding specified dBA level is not necessarily lower during Saturday – Sunday as it is in the case of outdoor noise. This is expected as Saturday is a working day for the workshop with full activity. Further, in the motor repair business such as this one, it is not unusual that Saturday is the busiest of all the days with customers insisting that their vehicles be ready for the weekend.

CONCLUSION

Outdoor noise levels in large metropolitan areas are a complex mixture of noise from transportation, factories, machines and people. An effective noise abatement programme is difficult to establish without a knowledge of the types of noise, the level or intensity of the noise, the characteristics of the noise, the time of day of the occurrence and, finally, the activity or area where the noises are produced. All of these factors will govern the emphasis and direction of urban noise abatement programmes.

The present investigation demonstrates that a simple but continuous observation can provide useful knowledge to environmental managers concerned with noise abatement. This is because

1/ the data clearly present the variation in dBA level over a typical 24-hour period;

2/ they indicate the maximum noise levels that occur and the time of day they occur;

3/ when extended to other categories of activities, they provide a comparison of background noise levels within the city area e.g. manufacturing, commercial, business and residential districts;

4/ they establish "baseline" reference levels for future comparison in evaluation and judgement of noise abatement goals; and finally,

5/ they provide "baseline" data which can be utilized for the prediction of building occupant acceptance.

TABLE 1. Percentage Frequency of Occurrence of Hourly Outdoor Noise Level According to Specified dBA Level Along Jalan Kucai Lama, Kuala Lumpur, 21.11.83 – 27.11.83

Noise Level (dBA)	Monday – Tuesday	Tuesday – Wednesday	Wednesday – Thursday	Thursday – Friday	Friday – Saturday	Saturday – Sunday
80 and above	45.8	41.7	29.2	37.5	41.7	16.7
75 " "	62.5	66.7	62.5	58.3	70.8	54.2
70 " "	83.3	83.3	87.5	75.0	91.7	70.8

(Source: Field Measurement)

TABLE 2. Percentage Frequency of Occurrence of Hourly Indoor Noise Level According to Specified dBA Level Along Jalan Kucai Lama, Kuala Lumpur, 21.11.83 – 27.11.83

Noise Level (dBA)	Monday – Tuesday	Tuesday – Wednesday	Wednesday – Thursday	Thursday – Friday	Friday Saturday	Saturday – Sunday
70 and above	33.3	12.5	0.0	0.0	4.2	4.2
65 " "	41.7	37.5	8.3	12.5	4.2	16.7
60 " "	62.5	66.7	54.2	45.8	45.8	37.5
55 " "	70.8	66.7	66.7	66.7	58.3	54.2
50 " "	79.2	70.8	79.2	91.7	83.3	58.3

(Source: Field Measurements)

In the present study, the measurement intervals, due to lack of manpower, have been fixed for one hour. This, however, is much too coarse for purpose of noise abatement planning. A more refined procedure is reqiured to enable us to depict a statistical plot of the noise level for every say, 15 minutes of the 24 – hour period. Naturally, more manpower and sophisticated equipments will be needed in order to achieve this standard of accuracy and data coverage.

ACKNOWLEDGEMENTS

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